of the butterfly on the island.

It seems possible that we may witness a repetition of the story of the Small White, *Pieris* (*Artogeia*) *rapae,* recently recorded by Niells L. Wolff. This species was not known to occur on Madeira until December 1971, when a specimen was caught near Funchal. Three years later, in July 1974, the butterfly suddenly became extremely common and widespread over the island, flying from sea level to 1,500 m. or more. Mr. Riley tells me that it was by far the commonest butterfly seen during his visit. Referring again to *P. aegeria,* I think this must be accepted provisionally as a Madeiran species, although only a single specimen from the island is known at present. Ref.: Wolff, N. L. 1975. *Bol. Mus. Munic. Funchal,* **XXIX**: 26-32. — Dr. L. G. Higgins, Focklesbrook Farm, Chobham, Woking, Surrey.

Lithophane leautieri (Boisd.) in Winchester. — Although I have been running an m.v. trap for the last three years in Winchester, during 1974 and 1975 there was no sign of *Lithophane leautieri* (Boisd.), which was first recorded in Britain by Dr. K. G. Blair at Freshwater, Isle of Wight, in 1951. Mr. B. Goater in *The Butterflies and Moths of Hampshire and the Isle of Wight* mentions that the species now seems to be established at Martyr Worthy (about five miles N.E. of Winchester), one or two being recorded annually, and these were the nearest records to Winchester itself. This year, however, six specimens have appeared up to 29th October, all on different nights, in my m.v. trap in Winchester, actual dates being October 9th, 11th, 13th, 14th, 15th and 28th. It appears that the spread of this comparatively new addition to the British list is continuing. — Colonel D. H. Sterling, "Tangmere", 2 Hampton Lane, Winchester, Hants., 30.x.1976.

Green Islands of the Nepticulidae. — I have read with interest the discussion surrounding this phenomenon, in particular the notes by Mr. E. H. Wild (*Ent. Rec.,* **88**: 103) and Col. A. M. Emmet (*ibid.,* **88**: 207). Although not claiming to advance any definitive solution to the problem, I feel it worth considering two possible causes of the green islands. Firstly, that the presence of the larva induces and sustains the island. If true, this would be by no means a unique situation. The chlorosis (yellowing) associated with the later stages of diseases caused by certain rusts and mildews is often broken by islands of green tissue surrounding the sites of initial infection, and these islands may persist for some considerable time against a background of chlorotic and senescent tissue. Furthermore, it is possible to experimentally induce the formation of green islands by procedures such as application of fungal or yeast extracts, or by the use of synthetic chemicals which resemble natural plant hormones. In some cases they can be induced to form on leaves that are already yellowing. Thus it is possible for a green island to be induced and sustained by an external influence. Could such an external influence be a Nepticulid

larva? On balance I feel that it could not. As Col. Emmet points out, the green islands associated with *Ectoedemia subbimaculella* (Haworth) develop regardless of whether or not the larva survives its early ecdyses. There appears to be no precedent for such a lengthy persistence of the effect after removal of the cause.

The second explanation involves the green island persisting by default, rather than being actively sustained. To investigate this possibility, it is necessary to examine the natural sequence of events leading up to leaf fall. Mr. Wild describes the gross effects of leaf abscission, but in many species development of the final abscission layer is preceded by a gross reduction in the chlorophyll content, and a net export from the leaf of protein nitrogen and many of the more mobile ions such as potassium, magnesium and phosphorus. Removal of the chlorophyll in particular leads to the exposure of the accessory pigments such as anthocyanins and carotenoids, which give the leaves their characteristic autumn colouration. Recent work also suggests that some "waste" products are passed into the leaf prior to abscission, and that these contribute to the general necrosis which follows leaf fall. Thus the second hypothesis for the development of green islands is that the presence of the larva in some way prevents (a) the receipt and execution of signals (? hormones) designed to initiate senescence and death in the leaf; (b) the degradation of chlorophyll and export of essential minerals, and (c) transport into the leaf of toxic waste products. All these objectives can be achieved by the expedient of blocking the leaf vein serving the area and will subsequently become a green island.

The question now arises of how a very small larva would be able to block a relatively large sector of leaf veins. I would suggest that the larva plays no active part in this procedure, but that the plant itself seals off part of its vascular system as a natural host reaction to invasion by a parasite. Such a reaction can be observed in response to invasion of plant tissue by certain fungal and bacterial pathogens, presumably in an attempt to isolate the invading organism.

To summarise the hypothesis: the development of a green island results from a host reaction to the presence of a small larva. This host reaction effectively isolates a sector of the leaf from the normal transport systems of the plant, and as a consequence that sector fails to die in the prescribed manner. This failure is exploited by the larva, which completes its development in the remaining green tissue. It would follow from this that the shape and extent of the green island would be determined by the position on the leaf where the larva first begins the mine, and on the nature and extent of the venation on the leaf. The only mine I have to hand at the moment is that of the aspen feeding *Ectoedemia argyropeza* (Zeller), whose triangular green island extends over the area served by one of the three major veins arising from the petiole. — P. A. Sokoloff, 4 Steep Close, Green Street Green, Orpington, Kent.